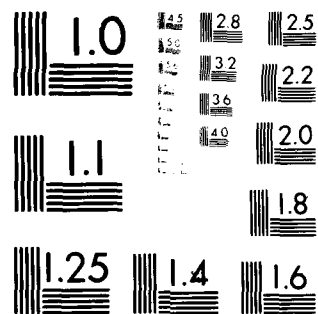


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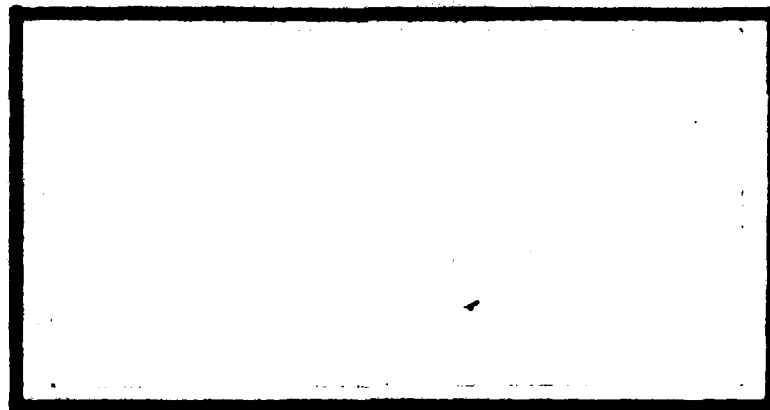
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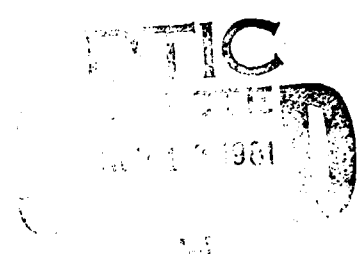
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DETERMINATION OF CONTRACT SUITABILITY  
TO THE AWARD FEE CONCEPT

Holly R. McLelland, First Lieutenant, USAF  
David D. Odor, Captain, USAF

LSSR 27-81

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1. REPORT NUMBER LSSR-27-81	2. GOVT ACCESSION NO. AD-A107 465	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) DETERMINATION OF CONTRACT SUITABILITY TO THE AWARD FEE CONCEPT.		5. TYPE OF REPORT & PERIOD COVERED Master's Thesis
7. AUTHOR(s) Holly R. McLelland, First Lieutenant, USAF David D. Odor, Captain, USAF		6. PERFORMING ORG. REPORT NUMBER
9. PERFORMING ORGANIZATION NAME AND ADDRESS School of Systems and Logistics Air Force Institute of Technology, WPAFB OH		8. CONTRACT OR GRANT NUMBER(s)
11. CONTROLLING OFFICE NAME AND ADDRESS Department of Communication and Humanities AFIT/LSH, WPAFB OH 45433		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office)		12. REPORT DATE June 1981
		13. NUMBER OF PAGES 39
		15. SECURITY CLASS. (of this report) UNCLASSIFIED
16. DISTRIBUTION STATEMENT (of this Report) Approved for public release; distribution unlimited		15a. DECLASSIFICATION/DOWNGRADING SCHEDULE
17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)  Air Force Institute of Technology (ATC) Wright-Patterson AFB, OH 45433		
18. SUPPLEMENTARY NOTES  APPROVED FOR PUBLIC RELEASE AFR 190-17. FREDRIC C. LYNCH, Major, USAF Director of Public Affairs		
19. KEY WORDS (Continue on reverse side if necessary and identify by block number) AWARD FEE INCENTIVE METHODS CONTRACT MANAGEMENT CONTRACTOR MOTIVATION COST PLUS AWARD FEE 1 AUG 1981		
20. ABSTRACT (Continue on reverse side if necessary and identify by block number) Thesis Chairman: James Masters, Major, USAF		

LSSR 27-81

DETERMINATION OF CONTRACT SUITABILITY  
TO THE AWARD FEE CONCEPT

A Thesis

Presented to the Faculty of the School of Systems and Logistics  
of the Air Force Institute of Technology

Air University

In Partial Fulfillment of the Requirements for the  
Degree of Master of Science in Logistics Management

By

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June 1981

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This thesis, written by

First Lieutenant Holly R. McLelland

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has been accepted by the undersigned on behalf of the  
faculty of the School of Systems and Logistics in partial  
fulfillment of the requirements for the degree of

MASTER OF SCIENCE IN LOGISTICS MANAGEMENT  
(CONTRACT AND ACQUISITION MANAGEMENT MAJOR)

DATE: 17 June 1981

  
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## ACKNOWLEDGEMENTS

We wish to express our appreciation to those people who provided interest and assistance in this thesis effort. Included is Mr. Don O'Neil who provided initial assistance and encouragement.

We are particularly thankful to Janna Odor and Steve Bernard for their understanding and encouragement.

We also would like to thank our typists, Janna Odor and Phyllis Reynolds, without whom this effort would not have been finished.

## TABLE OF CONTENTS

	Page
ACKNOWLEDGEMENTS . . . . .	iii
LIST OF TABLES . . . . .	vi
 Chapter	
I. INTRODUCTION . . . . .	1
Background . . . . .	1
Statement of the Problem . . . . .	2
II. LITERATURE REVIEW . . . . .	3
Overview . . . . .	3
DOD Acquisition Process . . . . .	3
Expert Opinion on the Use of Award Fee . . . . .	6
DOD Experience with Award Fee . . . . .	8
Contractor Motivation . . . . .	9
Summary of the Literature . . . . .	11
III. RESEARCH OBJECTIVES AND HYPOTHESES . . . . .	12
Overview . . . . .	12
Statement of the Research Objective . . . . .	12
Identification of Research Variables . . . . .	13
Research Hypotheses . . . . .	15
Research Question . . . . .	16
IV. METHODOLOGY . . . . .	17
Overview . . . . .	17

Chapter	Page
Data Definition and Sources . . . . .	17
Data Limitations . . . . .	19
Analysis Procedures . . . . .	21
V. RESULTS AND CONCLUSIONS . . . . .	23
Overview . . . . .	23
Research Results . . . . .	23
Tests of the Hypotheses . . . . .	23
Construction of the Model . . . . .	23
Final Statistical Model . . . . .	25
Conclusions and Implications . . . . .	31
Recommendations for Further Research . . . . .	32
Concluding Remarks . . . . .	33
SELECTED BIBLIOGRAPHY . . . . .	35
A. REFERENCES CITED . . . . .	36
B. RELATED SOURCES . . . . .	37

# LIST OF TABLES

Table		Page
1.	Results of Pearson Product Moment Correlation of Percent of Award Fee Paid to the Independent Variables . . . . .	24
2.	Correlation Matrix of Independent Variables . . . . .	26
3.	Varimax Rotated Factor Matrix After Rotation with Kaiser Normalization . . . . .	27
4.	Table of Factor Identification . . . . .	28
5.	Eigenvalues and Explained Variance From the Initial Factor Matrix . . . . .	29
6.	Results of Stepwise Regression of Factor Scores to Percent of Award Fee Paid . . . . .	30

## CHAPTER I

### INTRODUCTION

#### Background

The Defense Acquisition Regulation (DAR) defines Award Fee as:

. . . a means of applying incentives in contracts which are not susceptible to the finite measurements of performance necessary for structuring incentive contracts. Award Fee may be earned by the contractor in whole or in part. The amount of the Award Fee to be paid is based upon a subjective evaluation by the Government of the quality of the contractor's performance, judged in the light of criteria set forth in the contract. . . . The decision that Award Fee has been earned is based on the reports of performance made by the Government personnel knowledgeable with respect to the contract requirements. This decision is a unilateral determination made by the Government, not subject to the Disputes Clause of the Contract [3:p.3:40].

In A Guide to Award Fee issued 26 January 1978 by Air Force Systems Command (AFSC), Major General James Stansberry, DCS for Contracting and Manufacturing, defined Award Fee as:

. . . a management technique which provides a means of applying incentives in contracts or to certain areas of performance within contracts which are not generally susceptible to a finite measurement of performance. The purpose of the Award Fee contract incentive is to motivate superior performance by the contractor, and to reward the contractor for performance which exceeds basic contract requirements [15:2].

The concept of the Award Fee contract has existed within the federal government since the 1950s. The Navy

and the National Aeronautical and Space Administration (NASA) used Award Fee contracts on a limited basis in the early 1960s. The Air Force still considered their use experimental as late as 1978. In FY 79 Award Fee accounted for 2.9 percent of all contracts over \$10,000, and totaled over \$1.5 billion (8). An estimate of the government's administrative costs for a moderate-sized Award Fee program was \$115,000 annually, (7:153). The burden of the administrative costs is considered to be justified when the government realizes greater benefits as a result of the Award Fee provision.

#### Statement of the Problem

There is a general lack of definitive guidance for evaluating the suitability of any contract to the Award Fee concept. With no formalized guidelines for the selection of a contract, there is no objective way to judge the possible, or probable, cost to benefit ratio of a given contract.

## CHAPTER II

### LITERATURE REVIEW

#### Overview

This chapter presents a brief description of the Major Weapon System Acquisition Process as identified in government regulations, followed by expert opinion on the use of the Award Fee in the process. Expert opinion is presented due to the lack of an empirical body of knowledge on the subject. Because the Award Fee concept is expressly designed to motivate contractors, a discussion of contractor motivations follows a summary of Department of Defense (DOD) experience with Award Fee.

#### DOD Acquisition Process

DOD uses two primary directives (DOD Directive 5000.1 and 5000.2) in the execution of the general guidelines outlined by the Office of Management and Budget (OMB) Circular A-109. Four key decision points are identified with separate phases of the program, structured as follows:

1. Milestone 0 Program Initiation. OMB Circular No. A-109 requires the Secretary of Defense and DOD Component Heads to continually analyze current and forecasted mission capabilities, technological opportunities,



overall priorities, and resources. When the analysis identifies a deficiency in the existing agency capabilities or an opportunity to establish new capabilities in response to a technologically feasible opportunity, this will be set forth in a Mission Element Need Statement (MENS). This statement includes the mission purpose, capability, agency components involved, time constraints, value or worth of meeting the need, relative priority, and operating constraints. It is not to be expressed in terms of equipment or other means which might satisfy the need. Mission needs may be determined by agency analyses or through studies directed by appropriate executive or legislative authority (11:6-7). Once the mission need is determined to be valid, the Secretary of Defense may approve that a DOD-component systematically and progressively explore and develop alternative system concepts.

2. Milestone 1 Demonstration and Validation. When competitive exploration of alternative system concepts merit system demonstration, approval to proceed must be secured. Recommendations are documented in a Decision Coordinating Paper (DCP), and reviewed by the Defense System Acquisition Review Council (DSARC) and the (Service) System Acquisition Review Council prior to a Secretary of Defense decision.

3. Milestone 2 Full-Scale Engineering Development. When the demonstration and validation phase has been

completed and the system merits full-scale engineering development, recommendations are documented by the DSARC in a DCP prior to the Secretary of Defense decision. If the system is approved for full-scale engineering development, long lead-time production items and limited production of prototypes for test and evaluation may be authorized.

4. Milestone 3 Production and Deployment. Upon completion of the full-scale engineering development phase, which includes successful completion of Operation, Test, and Evaluation (OT&E), production of a system may be approved by the Secretary of Defense. The DCP is a key document in the DSARC process as it encompasses the MENS, a description of alternatives, and a summary of the program acquisition strategy (5). This acquisition strategy should contain a contingency plan identifying the myriad of program considerations to achieve goals in an economical, effective, and efficient manner (11:10). As stated in the Office of Federal Procurement Policy (OFPP) Pamphlet No. 1 on the application of OMB Circular No. A-109:

In developing a system acquisition strategy considerable thought should be given to specific program goals and objectives. The approach should not be reduced to fill-in-blank formats or cookbooks. The strategy should form the basis for the program manager's system acquisition plan. He should then use his plan to communicate with higher authority, his management team, interfacing government organizations, and industry. The plan should also provide the means to measure accomplishments and consider contingencies as the

program progresses. At program initiation, it is neither possible nor desirable to address all considerations in detail. It is possible and desirable, however, to examine and schedule when decisions on each consideration can and must be made throughout the acquisition process and to refine the strategy and planning as the program proceeds.

The plan should encompass the entire system acquisition process with emphasis on the near term time phased actions. As the program proceeds and periodic reviews are made, the next increment of near term considerations should be emphasized. Such an approach minimizes the planning burden and provides a basis for program direction and for measurement of success against program goals and objectives [5:4].

The Department of Defense defines major programs as those with an estimated research, development, test and evaluation (RDT&E) cost exceeding \$75 million, or an estimated production cost exceeding \$300 million.

#### Expert Opinion on the Use of Award Fee

The purpose of including the Award Fee in a contract is to motivate the contractor to provide better performance. Major General Stansberry states that the purpose of Award Fee:

. . . is to motivate superior performance which exceeds basic contracts requirements. Properly applied, an Award Fee incentive provides a unique combination of flexibility and potential for contractor motivation not generally present in other types of contractual arrangements [1:2].

Award Fee seeks to improve contractor performance by providing management incentives. Stansberry addresses this point when he states:

. . . Although the Award Fee incentive is principally designed to stimulate superior contractor performance, it also serves as a vehicle for management

communication between the Government and the contractor. If properly used, it enables the Government to place management emphasis in particular areas and to transmit this emphasis to the contractor [15:2].

Award Fee is most suitable for use on or in conjunction with contracts in which it is difficult to measure performance, and where the Government wants to play an active role in the management of the contract. Dr. Hunt states that the Award Fee concept aids the Government in dealing with performance uncertainty and provides for active participation in ten ways, which he refers to as the "hallmarks of Award Fee acquisition strategy." Award Fee:

1. encourages government-contractor cooperation,
2. assures an active role for government managers,
3. recognizes limitations on top management ability to control operations,
4. stimulates formal and informal communication,
5. recognizes variability of motivations,
6. leaves to contractors the task of motivating their own personnel,
7. views the acquisition process as dynamic,
8. is flexible and provides room for human judgment,
9. simplifies contractual provisions, and
10. helps assure that profits are earned [7:27].

Award Fee contracts differ from traditional incentive contracts by establishing a framework in which the government and contractor personnel have an active role in exercising managerial judgment. Dr. Hunt calls this ". . . a managerialist rather than a contractualist approach to acquisition [6:ii]."

Award Fee, when applied to the correct programs, is considered by contractor and government personnel to be a "potent motivator . . . a strong motivator, simply

because it concentrates on management [7:186]." Award Fee cannot be validly applied to all contracts; it is not a concept which will correct and prevent all problems which occur in the government-contractor relationship. If improperly used, it may increase the administrative burden on both the government and the contractor and may actually be detrimental to successful contract performance (15:2). Observations along such lines were made by Mr. John N. Malloy, Deputy Assistant Secretary of Defense, in his 1968 paper "Contracting for Major Weapon Systems." He inferred that if the DOD had learned any lessons from the past, it was that the procurement approach must be tailored to the specific acquisition objectives, considering the nature of the program; that in the past the tendency had been to fit the procurement of each new system to the approach popular at the time. He further states:

Of all the types of contracts authorized for use by the Armed Services Procurement Regulation (ASPR) none are considered "bad" in themselves. It is the selection of an appropriate type for a particular program that is often wrong [10:28].

#### DOD Experience with Award Fee

Subjective, "after the fact" evaluations of contractor performance have been used within the government since the 1950s. Actual use of the Award Fee concept began in the 1960s following discussions of the concept by the Secretary of Defense at the National Security

Industrial Association (NSIA) on 15 June 1961 (13:27). Professor Fredric M. Scherer discussed the concept in the Harvard Weapons System Acquisition Research Project (12:327). In the early 1960s NASA and the Navy developed the Award Fee contracting procedures which remain relatively unchanged today (13:28). The early Award Fee contracts were used mainly in support services such as operations and maintenance, technical services, management and engineering, instrumentation, data acquisition and reduction, and hardware integration (13:28).

Cost Plus Award Fee (CPAF) contracts are the most common use of the Award Fee concept. In addition to CPAF contracts, the Award Fee feature may be used as an adjunct to Cost Plus Incentive Fee (CPIF) or Fixed Price Incentive Fee (FPIF) contracts. In this way, the Award Fee incentive will be in addition to the other incentives in such contract types (15:3). By using Award Fee in conjunction with these contracts, the government seeks to motivate contractors in special emphasis areas which cannot be measured by criteria applicable to the traditional incentive contracts.

#### Contractor Motivation

From a study conducted by the Logistics Management Institute, it was found that:

There is virtually unanimous agreement among managers and analysts who have studied overall contractor motivation that, in the short run, contractor management does sacrifice short run profit on defense business in favor of achieving:

1. company growth,
2. increased share of the industry market,
3. better public image,
4. organizational prestige,
5. carry-over benefits to commercial business (commercial spinoffs),
6. greater opportunity for follow-on business, or
7. greater shareholder expectations for future growth and profit [9:8].

Obviously, industrial firms cannot sacrifice short run profit on a continuous basis. However, the study goes on to give reasons why a company will accept a loss (or low profit or fee); if doing so provides an opportunity to:

1. gain competitive advantage by engaging in developmental effort in areas of potential future business,
2. acquire or retain competent personnel in scarce disciplines,
3. spread fixed costs over a substantially broader base, or
4. prevent a potential competitor from gaining entry to the market [9:9].

They also point out that the remuneration of managers as well as their prestige and professional stature, is more dependent on company sales than on profit rate. They summarize by stating:

Whether management is operating in the company's interest or for its own personal gain, it does not attempt to maximize profit or fee on individual contracts. It attempts to optimize among many objectives, placing particular stress on those which contribute most to maintaining the future strength of the firm. The drive for profit is not absent, but is constrained by aims which ultimately are more consequential [9:8-9].

### Summary of the Literature

Award Fee is an incentive method which attempts to improve contractor management performance by use of subjective evaluations and a monetary pool for potential award. The provision is structured to place a fee potential on those areas of performance, and at those times, which will be most beneficial to the government. The decision to include Award Fee as a provision of a contract is made early in the contracting process. The studies reviewed for this research do not address the decisions which must be made when approving Award Fee for a program.

Experts in the field agree that if improperly used, Award Fee will yield negative returns on the government dollars spent administering the program. There is no indication of what characteristics must be present to assure the government and contractor will benefit from participating in an Award Fee contract. Can information which is known prior to award of the contract be used to determine how the contractor will perform with an Award Fee contract? What those characteristics, or information, are and to what extent they help predict the contractor's performance, can be a starting point for establishing more clearly defined guidelines for use in contract approval.



## CHAPTER III

### RESEARCH OBJECTIVES AND HYPOTHESES

#### Overview

This chapter presents a statement of the research objective, identifies the research variables, and poses research hypotheses and a research question.

#### Statement of the Research Objective

This research attempts to identify a series of quantifiable characteristics which, when present in a contract, will identify that contract as suitable or not suitable as an Award Fee contract. Once identified, the characteristics are used to develop a model of contract suitability.

For purposes of this research, a contract shall be considered suitable to the Award Fee concept when aspects of the contract indicate a high probability that a majority of the Award Fee pool would be earned by the contractor. While Award Fee is defined as subjective grading of aspects of contracts "not susceptible to finite measures," this research attempts to determine suitability based on the quantifiable aspects of the contracts and contractors involved.

It is beyond the scope of this research effort to attempt to estimate the costs and benefits of contracts. This research assumes that if the goals of the Award Fee portion of a contract are met, and so, that the majority of the available Award Fee pool is paid to the contractor, then the Award Fee concept was in fact well suited to the contract and served to motivate the contractor as the government desired.

#### Identification of Research Variables

The following independent variables are identified as having possible impact on contract suitability:

1. Kind of Contract. This variable identifies the type of effort contracted for, to include Research and Development, Services, Production, etc.

2. Criticality Designator. This variable is a priority designator assigned to each contract by the purchasing office according to the following criteria:

- A high priority projects (DX rated) or programs designated by the President; DOD or service-directed critical programs; contracts negotiated under public exigency or unusual urgency; or small purchases otherwise meeting the requirements of public exigency.
- B if not designator A, contracts for those items required to maintain a Government or contractor production or repair line.
- C all contracts other than A or B [3:p.25:103].

3. Contract Price. The final price of the awarded contract.

4. Size of the Award Fee Pool. Total dollar value of the Award Fee Pool available to the contract.

5. Contract Duration. The time interval in days from contract effective date to the end of the period of performance.

6. Level of Effort. The Level of Effort contract describes the scope of work in general terms and obligates the contractor to devote a specified level of effort over a stated period of time. Payment is based on effort expended rather than on results achieved.

7. DOD Sales. A contractor's total volume of sales to DOD in the year of contract award.

8. Total Sales Volume. A contractor's total sales revenue from all sources for the year of contract award.

9. Number of Employees. Total number of personnel employed by the contractor in the year of contract award.

The dependent variable identified for this research is:

Suitability. The percentage of available Award Fee paid to the contractor for performance under the contract. As contractor performance is "not susceptible to finite measures" on Award Fee contracts, this objective indicator of performance has been adopted to define the concept of suitability.

### Research Hypotheses

This research attempts to test the following hypotheses:

Null Hypothesis H1. The kind of contract is not correlated to the percent of Award Fee paid.

Alternative Hypothesis H1. The kind of contract is correlated to the percent of Award Fee paid.

Null Hypothesis H2. The criticality designator is not correlated to the percent of Award Fee paid.

Alternative Hypothesis H2. The criticality designator has a positive correlation to the percent of Award Fee paid.

Null Hypothesis H3. The contract price is not correlated to the percent of Award Fee paid.

Alternative Hypothesis H3. The contract price has a positive correlation to the percent of Award Fee paid.

Null Hypothesis H4. The size of the Award Fee Pool is not correlated to the percent of Award Fee paid.

Alternative Hypothesis H4. The size of the Award Fee Pool has a positive correlation to the percent of Award Fee paid.

Null Hypothesis H5. The duration of the contract is not correlated to the percent of Award Fee paid.

Alternative Hypothesis H5. The duration of the contract has a positive correlation to the percent of Award Fee paid.

Null Hypothesis H6. The designation of a contract as level of effort is not correlated to the percent of Award Fee paid.

Alternative Hypothesis H6. The designation of a contract as level of effort has a positive correlation to the percent of Award Fee paid.

Null Hypothesis H7. The volume of the contractor's DOD sales is not correlated to the percent of Award Fee paid.

Alternative Hypothesis H7. The volume of the contractor's DOD sales has a positive correlation to the percent of Award Fee paid.

Null Hypothesis H8. The contractor's total sales volume is not correlated to the percent of Award Fee paid.

Alternative Hypothesis H8. The contractor's total sales volume has a positive correlation to the percent of Award Fee paid.

Null Hypothesis H9. The number of personnel a contractor employs is not correlated to the percent of Award fee paid.

Alternative Hypothesis H9. The number of personnel a contractor employs has a positive correlation to the percent of Award Fee paid.

For purposes of this research, statistically significant is defined as less than or equal to the 0.10 level.

#### Research Question

This research attempts to answer the following research question:

Can a statistical model or profile of a contract be constructed, which will accurately predict the suitability of a contract to the Award Fee concept?

## CHAPTER IV

### METHODOLOGY

#### Overview

This chapter describes and defines the data base, identifies the sources of the data, and discusses the analytic procedures used to test the research hypotheses and to answer the research question.

#### Data Definition and Sources

The data base for this research consists of 26 Award Fee contracts completed between 1973 and 1980. The contracts were selected from the Air Force Systems Command Acquisition Management Information System (AMIS). The contracts were awarded by the Army, Navy, or Air Force, with administrative responsibility delegated to Air Force Contract Management Division. The contracts represented awards to seven different contractors.

To test the research hypotheses the following variables are selected:

1. Kind of Contract. The data base includes 14 "Research and Development" contracts, 10 "Service" contracts and 2 classified as "Other" contracts. The classifications were extracted from AMIS.

2. Criticality Designator. The data base includes 3 contracts designated "A", 4 contracts designated "B", and 19 contracts designated "C". The designations were extracted from AMIS.

3. Contract Price. The data base includes final contract prices ranging from \$451,134 to \$65,203,796. The prices were extracted from AMIS or through the contract administration office.

4. Size of the Award Fee Pool. The data base includes contracts with Award Fee Pools ranging from \$36,701 to \$3,738,324. The pool is divided by the contract price to convert the figure to a percentage of the contract price. This information is only available from the contract buying or administration office.

5. Contract Duration. The data base includes contracts ranging from 366 to 1463 days. The data were extracted from AMIS.

6. Level of Effort. The data base includes four contracts identified as level of effort. This information is only available from the contract buying or administration office.

7. DOD Sales. The data base includes contractors with gross sales to DOD ranging from \$102,000 to \$2,385,459,000. The sales to DOD are divided by the contractor's total sales volume to convert the figure to DOD

sales as a percentage of total sales. These data were gathered from Federal Contracts Reports (6) or the contract administration office.

8. Total Sales Volume. The data base includes contractors with total sales volume ranging from \$1,580,000,000 to \$8,130,000,000. These data were gathered from Standard and Poor's Register of Corporations, Directors and Executives for the year of the contract or through the contract administration office (14).

9. Number of Employees. The data base includes contractors employing between 7,000 and 114,000 personnel. This information was extracted from Standard and Poor's Register of Corporations, Directors, and Executives for the year of the contract (14).

10. Amount of Award Fee Paid. The data base includes contracts with cumulative final Award Fee payments ranging from \$31,120 to \$3,447,724. The Award Fee payments are divided by the Award Fee Pool. The resulting percentages, ranging from 15 to 92 percent, are used as the indicator of the contract suitability to the Award Fee concept. These data are only available from the contract buying or administration office.

#### Data Limitations

The data base for this research has the following limitations:



1. The number of Award Fee contracts awarded by the federal government is unknown. As this contract type accounted for 2.9 percent in FY 79, it must be presumed that the sample size of 26 cases is small and subject to bias.

2. The sample is not random. Only contracts listed in AMIS as having completed the period of performance are considered. Thirty-nine such cases are listed in AMIS. Of the 39 cases, 13 are not available because the data were considered proprietary by the Army and would not be released.

3. Certain data elements are rounded and/or are abbreviated for storage purposes and are not subject to verification.

4. Year by year financial data are not available for all contractors and are estimated or replaced by data from the closest obtainable annual information.

5. The distribution of contract characteristics is not even. The data base is heavily weighted by the dominance of one contractor, a disproportionately small share of "Other" contracts, and the extremely limited number of "A" and "B" criticality designated contracts. It is not known whether or not the proportion of these variables in the sample is representative of Award Fee contracts in general.

6. No allowance is made for the contractor implementation of the contract Award Fee plan. The measure of the variable "implementation" is beyond the scope of this research.

7. In order to evaluate a potential contract prior to its award, the original estimated cost should be used in lieu of contract price. These data are not available to this research.

8. An assumption is made that contractors will perform to standards to receive Award Fee monetary compensation. It is further assumed that when less than all money from the pool is paid to the contractor, that the contract was not ideally suited to the Award Fee concept.

#### Analysis Procedures

To test the hypotheses and build a multivariate regression model to predict the suitability of a contract to the Award Fee concept, this research uses SPSS to apply the following statistical techniques:

1. Pearson Product Moment Correlation Analysis. The bivariate correlation of each independent variable with the percent of Award Fee paid is obtained.

2. Transformation. The correlations are analyzed for indications of linearity or possible linearity through transformation.

3. Factor Analysis. To control the multicollinearity of the variables, factor scores are computed and used in lieu of the variables.

4. Stepwise Multiple Regression. A forward stepwise multiple regression is accomplished on the factor scores to produce a multivariate regression model.

## CHAPTER V

### RESULTS AND CONCLUSIONS

#### Overview

This chapter presents the results and conclusions of the research effort, followed by recommendations for further study.

#### Research Results

##### Tests of the Hypotheses

The bivariate correlations obtained from the Pearson Product Moment Correlation Analysis between the selected variables and the percent of Award Fee paid are presented in Table 1. In general, all of the correlations are weak and of extremely low statistical significance. Only the Level of Effort variable was shown to have a statistically significant correlation with suitability.

Hypothesis 6, that the designation of a contract as level of effort is not correlated to the percent of Award Fee paid, was rejected. The other null hypotheses could not be rejected at the 0.10 significance level.

##### Construction of the Model

In the process of building the regression model, the following results were obtained:

TABLE 1  
RESULTS OF PEARSON PRODUCT MOMENT CORRELATION OF PERCENT OF AWARD FEE  
PAID TO THE INDEPENDENT VARIABLES

Independent Variables	Correlation Coefficient	Percent of Explained Variation	Observed Statistical Significance	Results of Hypotheses Testing
Kind of Contract				
R&D	-.023	0.05%	.457	Cannot reject the null
Service	.102	1.03%	.311	Cannot reject the null
Other	-.143	2.05%	.243	Cannot reject the null
Criticality Designator	-.189	3.56%	.178	Cannot reject the null
Dollar Value of Contract	.009	0.01%	.484	Cannot reject the null
Award Fee Pool (% of Contract)	-.106	1.12%	.304	Cannot reject the null
Contract Duration in Days	.022	0.05%	.458	Cannot reject the null
Level of Effort	.280	7.85%	.083	Reject the null
Contractor's DOD Sales (% of Total Sales)	-.116	1.35%	.286	Cannot reject the null
Contractor's Total Sales Volume	-.006	0.00%	.489	Cannot reject the null
No. of Contractor Employees	-.067	0.45%	.373	Cannot reject the null

Scatter diagrams of each independent variable on the dependent variable lack linearity. The data does not indicate that transformation could produce linearity.

The correlation matrix of individual variables (Table 2) indicates strong correlation between sets of variables, such as total sales volume and number of employees ( .960 ) and between Research and Development contracts and Service contracts ( .854 ).

Factor analysis reduces the collinear variables to orthogonal factors. A principal components analysis is performed on the factors and the results subjected to Varimax rotation with Kaiser normalization. The final iteration is shown in Table 3. The factor loadings are clear and strong. See Table 4 for factor identifications. Factor scores are computed for a nine-factor solution, which accounts for 99.7 percent of the total variation (see Table 5). These factor scores are used in a stepwise multiple linear regression on the dependent variable. The percentages of variance explained by the model was very small and the model is not statistically significant at the 0.10 level, as is shown in Table 6.

#### Final Statistical Model

The final and best predictive model that can be constructed from the data is a univariate model based on the variable Level of Effort.

TABLE 2

## CORRELATION MATRIX OF INDEPENDENT VARIABLES

	Kind of Contract- Other	Kind of Contract- R&D	Kind of Contract- Services	Criticality Designator	Contract Price	Award Fee Pool as a % of Price
Kind of Contract-Other	1.000	-	-	-	-	-
Kind of Contract-R&D	-.312	1.000	-	-	-	-
Kind of Contract-Service	-.228	-.854	1.000	-	-	-
Criticality Designator	.049	-.608	.596	1.000	-	-
Contract Price	.499	.023	-.297	-.146	1.000	-
Award Fee Pool as a % of Price	-.236	.587	-.472	-.287	-.291	1.000
Contract Duration in Days	.234	.455	-.595	-.288	.472	.118
Level of Effort	-.123	-.033	.101	-.084	-.047	.073
DOD Sales as a % of Total	-.113	-.257	.325	.342	-.205	-.063
Total Sales Volume	-.112	.272	-.217	-.074	-.220	.276
Number of Employees	-.162	.257	-.175	-.047	-.268	.322
	Contract Duration in Days	Level of Effort	DOD Sales as a % of Total	Total Sales Volume	Number of Employees	
Kind of Contract-Other	-	-	-	-	-	
Kind of Contract-R&D	-	-	-	-	-	
Kind of Contract-Service	-	-	-	-	-	
Criticality Designator	-	-	-	-	-	
Contract Price	-	-	-	-	-	
Award Fee Pool as a % of Price	-	-	-	-	-	
Contract Duration in Days	1.000	-	-	-	-	
Level of Effort	-.002	1.000	-	-	-	
DOD Sales as a % of Total	-.112	-.228	1.000	-	-	
Total Sales Volume	-.307	.033	-.409	1.000	-	
Number of Employees	-.299	.107	-.339	.960	1.000	

TABLE 3

## VARIMAX ROTATED FACTOR MATRIX AFTER ROTATION WITH KAISER NORMALIZATION

	Kind of				
	Contractor Size	Contract- R&D or Services	Contract- Other	Level of Effort	Criticality Designator
Kind of Contract-Other	-.066	-.023	.960	-.066	.127
Kind of Contract-R&D	.161	.839	-.291	-.037	-.270
Kind of Contract-Service	.129	-.847	-.227	.075	.252
Criticality Designator	.003	-.362	.038	-.050	.908
Contract Price	-.156	.105	.263	-.018	-.058
Award Fee Pool as a % of Price	.176	.321	-.104	.045	-.098
Contract Duration in Days	-.255	.389	.114	.019	-.078
Level of Effort	.034	-.057	-.059	.989	-.037
DOD Sales as a % of Total Sales	-.258	-.030	-.065	-.129	.151
Total Sales Volume	.956	.118	-.026	-.017	-.012
No. of Employees	.967	.072	-.063	-.061	-.112

	Dollar			
	Value of Contract	Size of Award Fee Pool	Contractor's DOD Sales	Contract Duration
Kind of Contract-Other	.225	-.087	-.060	.084
Kind of Contract-R&D	.015	.256	-.089	.193
Kind of Contract-Service	-.139	-.213	.124	-.244
Criticality Designator	-.055	-.094	.159	-.063
Contract Price	.907	-.153	-.111	.183
Award Fee Pool as a % of Price	-.157	.904	.014	.040
Contract Duration in Days	.227	.049	-.051	.841
Level of Effort	-.015	.033	-.106	.011
DOD Sales as a % of Total Sales	-.105	.011	.927	-.043
Total Sales Volume	-.070	.069	-.177	-.124
No. of Employees	-.095	.121	-.096	-.074



TABLE 4

## TABLE OF FACTOR IDENTIFICATION

Factor Number	Variables Loaded	Factor Name
1	Total Sales Volume Number of Employees	Contractor Size
2	Kind of Contract - R&D Kind of Contract - Services	Kind of Contract: R&D or Services
3	Kind of Contract - Other	Kind of Contract - Other
4	Level of Effort	Level of Effort
5	Criticality Designator	Criticality Designator
6	Contract Price	Dollar Value of Contract
7	Award Fee Pool as a Percentage of Price	Size of Award Fee Pool
8	DOD Sales as a Percentage of Total Sales	Contractor's DOD Sales
9	Contract Duration in Days	Contract Duration

TABLE 5  
EIGENVALUES AND EXPLAINED VARIANCE FROM THE INITIAL FACTOR MATRIX

Factor	Eigenvalue	Percent of Variance Explained	Cumulative Percent
One	3.28270	30.8	30.8
Two	2.61387	23.8	54.5
Three	1.57078	14.3	68.8
Four	1.13164	10.3	79.1
Five	.72422	6.6	85.7
Six	.56728	5.2	90.8
Seven	.43922	4.0	94.8
Eight	.33867	3.1	97.9
Nine	.20244	1.8	99.7

TABLE 6

RESULTS OF STEPWISE REGRESSION OF FACTOR SCORES  
TO PERCENT OF AWARD FEE PAID

Step	Factor Entering	Percent of Explained Variance	Statistical Significance
1	Level of Effort	7.46	.177
2	Criticality Designator	14.41	.167
3	Kind of Contract - Other	17.20	.236
4	Contractor's DOD Sales	19.50	.312
5	Size of Award Fee Pool	20.98	.410
6	Contractor Size	21.36	.541
7	Kind of Contract - R&D or Services	21.55	.667
8	Dollar Value of Contract	21.60	.777

Percent of Award Fee to be paid = 60.294114  
+ 17.553776 LOE

LOE=1, if level of effort contract;

LOE=0, if not level of effort contract.

The significance of this model is .166, and it only explains 7.85 percent of the total variance in the percent of Award Fee paid.

### Conclusions and Implications

1. The individual independent variables selected by this research do not, by themselves, accurately predict contract suitability.

2. The independent variable, "Level of Effort," while being statistically significant at the .10 level, is not managerially significant, in that it only explains 7.85 percent of the variance in the suitability. To make a managerial decision on a variable that explains so little variance is not within the guidelines of sound managerial judgment.

3. A stepwise multiple regression model, based on the selected variables and the small sample size, does not adequately predict contract suitability to the Award Fee contract.

4. Variables which were considered to have an explanatory relationship to contract suitability did not prove to do so in this study. Until further research is

conducted, the selected variables should not be totally relied upon or singularly discounted.

#### Recommendations for Further Research

Recommendations for further research are:

1. It is the opinion of the researchers that additional study using a larger sample size and the variables selected for this research is warranted.

2. In addition to the variables selected for this research, other variables which can be identified prior to contract award should be studied as potential predictors of contract suitability. These variables might include, but not be limited to:

a. the amount of Government Furnished Equipment (GFE) and Government Furnished Property (GFP) provided in the contract,

b. the number of other contractors the prime contractor is required to interact with in the performance of the Award Fee contract,

c. at which phase points in the contracting process Award Fee is used, and

d. if it is a Research and Development contract, whether or not there is to be a follow-on contract.

3. It was indicated by various buying activities during the course of this research that Award Fee is frequently used in conjunction with other incentive

arrangements. Further study is recommended to determine if the benefits received from implementation of an Award Fee contract are higher with contracts which couple Award Fee and other incentive arrangements or on contracts which use Award Fee alone.

4. A more precise measurement of the contractor's performance should be developed. Because the percent of Award Fee paid is not based on objective standards, it is not possible to state that the government received the same cost to benefit ratio on all contracts on which the same percentage of the Award Fee pool is paid.

#### Concluding Remarks

The variables selected for this research were considered by the researchers as possible indicators of contract suitability to the Award Fee concept. While the results obtained from the research did not prove this to be true, the results did not conclusively prove that the variables are not suitability indicators. It is the opinion of the researchers that given a larger sample size more of the variance could be explained, and a model suitable for managerial decision making could be developed. The problems encountered in gathering data, particularly that considered proprietary, could be overcome given higher headquarters support of the project.

This research notwithstanding, it is the opinion of the researchers that a multivariate model of contract suitability to the Award Fee concept can be developed.

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